

Application No. 09/992,469
Amendment dated July 26, 2004
Reply to Office Action of March 26, 2004

Supplemental Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1-8. (Cancelled)

9. (Previously Amended) A unit for gripping and transporting bundles of signatures having small sizes or large size signatures in use with other units, the bundle gripping unit comprising:

a housing;

a lower support member and an upper clamp member each having a retracted position for releasing bundles therefrom from the lower support and upper clamp members, and the lower support member and upper clamp member each having an advanced position in which the lower support member and upper clamp member cooperate with each other to support bundles for cooperating to support bundles therewith for transport thereof of the bundles; and

adjustment controls of the support and clamp members for adjusting the position of the members to allow the members to be disposed closer to the housing for small size signature bundles and extended further from the housing for larger size signature bundles to minimize distances bundles project beyond the lower support member, the upper clamp member shifting in a first direction between the retracted position and the advanced position thereof, and in a second direction transverse to the first direction when adjusting the position of the upper clamp member closer to or further from the housing.

10. (Previously Amended) The bundle gripping unit of claim 9 wherein the housing has a top and bottom, the upper clamp member includes a clamping head and the lower support member includes a flat plate, and the upper clamp member is external and adjacent the top of

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the housing in the retracted position of the upper clamp member and the flat plate of the lower support member is adjacent the bottom of and completely in the housing in the retracted positions thereof position of the lower support member to minimize interference with bundles during pick-up and depositing of bundles.

11. (Previously Amended) ~~The bundle gripping unit of claim 9-A unit for gripping and transporting bundles of signatures having small sizes or large size signatures in use with other units, the bundle gripping unit comprising:~~

a housing;

a lower support member and an upper clamp member each having a retracted position for releasing bundles from the lower support and upper clamp members, and the lower support member and upper clamp member each having an advanced position in which the lower support member and upper clamp member cooperate with each other to support bundles for transport of the bundles; and

adjustment controls of the support and clamp members for adjusting the position of the members to allow the members to be disposed closer to the housing for small size signature bundles and extended further from the housing for larger size signature bundles to minimize distances bundles project beyond the lower support member, wherein the adjustment control of the lower support member includes a user operated control member and a scale external of the housing, the scale including indicia generally corresponding to the distance from the housing to which the support member will extend with the control member shifted along the scale to select the desired distance based on signature size.

12. (Previously Amended) The bundle gripping unit of claim 11 wherein the lower support member includes a cable drive system for shifting the support member between the retracted and advanced positions thereof, the control member includes an abutment in the housing and the cable drive system includes a stop which cooperates with the abutment to limit travel of the support member to the selected extended position thereof.

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13. (Previously Amended) ~~The bundle gripping unit of claim 9-A unit for gripping and transporting bundles of signatures having small sizes or large size signatures in use with other units, the bundle gripping unit comprising:~~

a housing;

a lower support member and an upper clamp member each having a retracted position for releasing bundles from the lower support and upper clamp members, and the lower support member and upper clamp member each having an advanced position in which the lower support member and upper clamp member cooperate with each other to support bundles for transport of the bundles; and

adjustment controls of the support and clamp members for adjusting the position of the members to allow the members to be disposed closer to the housing for small size signature bundles and extended further from the housing for larger size signature bundles to minimize distances bundles project beyond the lower support member, wherein the adjustment control of the upper clamp member includes an extendable slide bar having a clamping head mounted thereto for being shifted from positions closer to the housing to positions extended further therefrom, and the slide bar includes a releasable lock for fixing the bar against sliding with the clamp-clamping head at a desired extended position based on signature size.

14. (Previously Amended) ~~The bundle gripping unit of claim 9-A unit for gripping and transporting bundles of signatures having small sizes or large size signatures in use with other units, the bundle gripping unit comprising:~~

a housing;

a lower support member and an upper clamp member each having a retracted position for releasing bundles from the lower support and upper clamp members, and the lower support member and upper clamp member each having an advanced position in which the lower support member and upper clamp member cooperate with each other to support bundles for transport of the bundles; and

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adjustment controls of the support and clamp members for adjusting the position of the members to allow the members to be disposed closer to the housing for small size signature bundles and extended further from the housing for larger size signature bundles to minimize distances bundles project beyond the lower support member, wherein the upper clamp member includes a clamp head and a universal pivot mount therefor to allow the clamp head to clamp flush against bundles having an uneven build-up of signatures therein.

15. (Previously Amended) A compact unit for transporting signatures stacked into bundles, the unit comprising:

a housing having an internal space and further including a top and bottom defining a predetermined housing height, a front and a back defining a predetermined housing depth, opposite sides defining a predetermined housing width with the width being significantly smaller than the housing height and depth so that the housing is very narrow in the widthwise direction;

an upper clamp member and a lower support member having advanced positions in which the members cooperate to engage respectively uppermost and lowermost signatures in a bundle for clamping the bundle therebetween external of the housing, and retracted positions for release of the clamped bundles;

transverse linear guides for the clamp member and support member to guide linear sliding movement of the members between the retracted and advanced positions thereof with the upper clamp member shifting transverse to the advanced lower support member for clamping the bundles therebetween; and

power actuators in the internal space of the narrow housing operable to provide the clamp and support members with a variable range of travel between the retracted and advanced positions thereof for secure clamping of bundles of different sized signatures.

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16. (Previously Amended) The unit of claim 15-A compact unit for transporting signatures stacked into bundles, the unit comprising:

a housing having a top and bottom defining a predetermined housing height, a front and a back defining a predetermined housing depth, opposite sides defining a predetermined housing width with the width being significantly smaller than the housing height and depth so that the housing is very narrow in the widthwise direction;

an upper clamp member and a lower support member having advanced positions in which the members cooperate to engage respectively uppermost and lowermost signatures in a bundle for clamping the bundle therebetween, and retracted positions for release of the clamped bundles;

transverse linear guides for the clamp member and support member to guide linear sliding movement of the members between the retracted and advanced positions thereof with the upper clamp member shifting transverse to the lower support member for clamping the bundles therebetween; and

power actuators in the housing operable to provide the clamp and support members with a variable range of travel between the retracted and advanced positions thereof for secure clamping of bundles of different sized signatures, wherein one of the power actuator for the support member actuators has a fast stroke for retracting movement of the support member to minimize the pull on lowermost bundle signatures during bundle depositing operations, and has a slower stroke for advancing movement of the support member to minimize bundle damage during bundle pick-up operations.

17. (Original) The unit of claim 15 wherein the clamp member includes a clamp head and the lower support includes an elongate flat plat, and the clamp head travels along the height of the housing between the retracted and advanced positions thereof and the flat plate travels out from the bottom of the housing in the direction of the housing depth.

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18. (Original) The unit of claim 17 wherein the elongate flat plate is slightly shorter than the housing depth and narrower than the housing width so that the plate is retracted entirely within the bottom of the housing.

19. (Previously Amended) The unit of claim 15-A compact unit for transporting signatures stacked into bundles, the unit comprising:

a housing having a top and bottom defining a predetermined housing height, a front and a back defining a predetermined housing depth, opposite sides defining a predetermined housing width with the width being significantly smaller than the housing height and depth so that the housing is very narrow in the widthwise direction;

an upper clamp member and a lower support member having advanced positions in which the members cooperate to engage respectively uppermost and lowermost signatures in a bundle for clamping the bundle therebetween, and retracted positions for release of the clamped bundles;

transverse linear guides for the clamp member and support member to guide linear sliding movement of the members between the retracted and advanced positions thereof with the upper clamp member shifting transverse to the lower support member for clamping the bundles therebetween;

power actuators in the housing operable to provide the clamp and support members with a variable range of travel between the retracted and advanced positions thereof for secure clamping of bundles of different sized signatures, wherein the power actuators include fluid cylinders, and cables and pulleys between the cylinders and members, and

pulley carriages each having a plurality of pulleys mounted thereto about which the associated cable extends with the carriages driven by operation of the cylinders to provide the members with a greater amount of travel than the travel of the driven carriages carrying multiple pulleys to keep the housing compactly sized while maximizing the range of travel for the support and clamp members.

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20. (Original) The unit of claim 19 wherein the cylinders drive the carriages vertically between the top and bottom of the housing, and the pulleys and cables are arranged to cooperate to keep the height of the housing only slightly greater than a maximum height of the bundles to be clamped between the clamp and support members and the width of the housing only slightly greater than that of the carriages carrying the multiple pulleys therewith.

21. (Currently Amended) A bundle gripping apparatus for transporting signatures stacked into bundles, comprising:

a bundle gripping unit having:

a lower support having a predetermined length for fitting under a bundle to be transported;

an upper clamp head having an upper retracted position spaced from the bundle and a lowered advanced position for tightly engaging an upper surface of the bundle and clamping the bundle between the clamp head and lower support thereunder; and

a universal pivot mount of the clamp head that allows the advanced clamp head to pivot and self-adjust for keeping the clamp head in flush engagement with the bundle upper surface despite sloping of the upper surface; and

a drive for the clamp head that linearly shifts the clamp head between the retracted and advanced positions thereof substantially normal to the length of the lower support.

22. (Previously Amended) ~~The bundle gripping unit of claim 21 wherein~~ A bundle gripping apparatus for transporting signatures stacked into bundles, comprising:

a bundle gripping unit having:

a lower support having a predetermined length for fitting under a bundle to be transported:

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an upper clamp head having an upper retracted position spaced from the bundle and a lowered advanced position for tightly engaging an upper surface of the bundle and clamping the bundle between the clamp head and lower support thereunder; and

a pivot mount of the clamp head that allows the advanced clamp head to pivot and self-adjust for keeping the clamp head in flush engagement with the bundle upper surface despite sloping of the upper surface, the pivot mount includes a ball joint to allow for universal pivoting of the clamp head.

23. (Original) The bundle gripping unit of claim 21 wherein the clamp head includes a disc-shaped member.

24. (Previously Amended) The bundle gripping unit of claim 23 wherein the clamp member has a predetermined small size, and

an adjustable mounting member to which the small ~~pivotal~~ clamp member is attached for allowing the clamp head to be positioned at different extended positions for substantially central engagement with respect to the bundle to maximize the distribution of clamping forces provided by the ~~small~~ clamp head throughout the bundle.

25. (Original) The bundle gripping unit of claim 24 wherein the lower support member has a retracted position with support member withdrawn from under the bundle and a plurality of user-selectable advanced positions based on size of the bundle to be supported thereby.

26. (Previously Amended) The bundle gripping unit of claim 21 including hanger members and a support rail from which the hanger members support ~~the~~ a gripping unit with the rail having a predetermined length sized to allow multiple bundle gripping units to be adjustably mounted to the rail for handling one or more bundles, the gripping units being spaced from each other along the rail based on bundle size and number of bundles to be simultaneously handled.

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27-39. (Cancelled)